

Claims

What is claimed is:

1. A method of adapting a speech recognition system, wherein the method comprises steps of:
  - a. obtaining a sample of a speaker's speech during a first remote session;
  - b. recognizing the speaker's speech utilizing the speech recognition system during the first remote session;
  - c. modifying the speech recognition system according to the sample thereby forming a modified speech recognition system;
  - d. storing a representation of the modified speech recognition system in association with an identification of the speaker; and
  - e. using the representation of the modified speech recognition system to recognize speech during a subsequent remote session with the speaker.
2. The method according to claim 1 further comprising a step of cumulatively modifying the speech recognition system according to speech samples obtained during one or more remote sessions with the speaker.
3. The method according to claim 1 wherein the speaker is a telephone caller.
4. The method according to claim 1 wherein the step of modifying the speech recognition system comprises a step of modifying an acoustic model thereby forming a modified acoustic model and wherein the step of storing a representation of the modified speech recognition system comprises a step of storing a representation of the modified acoustic model.

1        5.            The method according to claim 4 wherein the representation of the modified  
2        acoustic model is a set of statistics which can be utilized to modify a pre-existing acoustic  
3        model.

1        6.            The method according to claim 4 wherein the representation of the modified  
2        acoustic model is a set of statistics which can be utilized to modify incoming acoustic speech.

1        7.            The method according to claim 1 further comprising a step of utilizing the  
2        modified speech recognition system during the first remote session with the speaker.

1        8.            The method according to claim 1 wherein the speech recognition system is  
2        speaker-independent prior to the first remote session.

1        9.            The method according to claim 1 wherein the step of modifying the speech  
2        recognition system is performed during the first remote session.

1        10.           The method according to claim 1 wherein the step of modifying the speech  
2        recognition system is performed after termination of the first remote session.

1        11.           The method according to claim 1 further comprising a step of obtaining the  
2        identification of the speaker during the first remote session.

1        12.           The method according to claim 11 further comprising a step of authenticating  
2        the speaker's identification by the speaker's speech.

1        13.           The method according to claim 2 wherein the speech recognition system is  
2        speaker-independent prior to the first remote session.

1 14. The method according to claim 2 wherein the step of modifying the speech  
2 recognition system is performed during the first remote session.

1 15. The method according to claim 2 wherein the step of modifying the speech  
2 recognition system is performed after termination of the first remote session.

1 16. The method according to claim 2 further comprising a step of authenticating  
2 the speaker's identification by the speaker's speech.

1 17. A method of adapting a speech recognition system, wherein the method  
2 comprises steps of:

- 3 a. obtaining a sample of a speaker's speech during a first remote session;  
4 b. recognizing the speaker's speech utilizing the speech recognition system during  
5 the first remote session;  
6 c. modifying the speech recognition system according to the sample thereby  
7 forming a modified speech recognition system;  
8 d. storing a representation of the modified speech recognition system in  
9 association with an identification of a cluster of speakers wherein the speaker is  
10 a member of the cluster; and  
11 e. using the representation of the modified speech recognition system to recognize  
12 speech during a subsequent remote session with a member of the cluster of  
13 speakers.

1 18. The method according to claim 17 further comprising a step of cumulatively  
2 modifying the speech recognizing system according to speech samples obtained during one or  
3 more remote sessions with one or more members of the cluster of speakers.

1      19.            The method according to claim 17 wherein the speaker is a telephone caller.

1      20.            The method according to claim 17 wherein the step of modifying the speech  
2      recognition system comprises a step of modifying an acoustic model thereby forming a  
3      modified acoustic model and wherein the step of storing a representation of the modified  
4      speech recognition system comprises a step of storing a representation of the modified  
5      acoustic model.

1      21.            The method according to claim 20 wherein the representation of the modified  
2      acoustic model is a set of statistics which can be utilized to modify a pre-existing acoustic  
3      model.

1      22.            The method according to claim 20 wherein the representation of the modified  
2      acoustic model is a set of statistics which can be utilized to modify incoming acoustic speech.

1      23.            The method according to claim 17 further comprising a step of utilizing the  
2      modified speech recognition system during the first remote session with the speaker.

1      24.            The method according to claim 17 wherein the speech recognition system is  
2      speaker-independent prior to the first remote session.

1      25.            The method according to claim 17 wherein the step of modifying the speech  
2      recognition system is performed during the first remote session.

1      26.            The method according to claim 17 wherein the step of modifying the speech  
2      recognition system is performed after termination of the first remote session.

1 27. The method according to claim 17 further comprising a step of  
2 identifying the cluster of which the speaker is a member during the first remote session.

1 28. The method according to claim 18 wherein the speech recognition system is  
2 speaker-independent prior to the first remote session.

1 29. The method according to claim 18 wherein the step of modifying the speech  
2 recognition system is performed during the first remote session.

1 30. The method according to claim 18 wherein the step of modifying the speech  
2 recognition system is performed after termination of the first remote session.

1 31. The method according to claim 18 further comprising a step of authenticating  
2 the speaker's identification by the speaker's speech.

1 32. A method of adapting a speech recognition system, wherein the method  
2 comprises steps of:

- 3 a. obtaining a sample of speech made by each of a plurality of speakers during a  
4 corresponding first remote session with each speaker;  
5 b. recognizing speech made by each speaker during the corresponding first remote  
6 session utilizing the speech recognition system configured to be speaker-  
7 independent;  
8 c. modifying the speech recognition system according to the sample from each  
9 speaker thereby forming a modified speech recognition system corresponding to  
10 each speaker;  
11 d. storing a representation of the modified speech recognition system  
12 corresponding to each speaker in association with an identification of the

- 13                   corresponding speaker; and  
14           e.       using the representation of the modified speech recognition system  
15                   corresponding to a speaker to recognize speech during a subsequent remote  
16                   session with the speaker.

1       33.           The method according to claim 32 further comprising a step of cumulatively  
2       modifying the speech recognition system for each speaker according to speech samples  
3       obtained during one or more remote sessions with the corresponding speaker.

1       34.           The method according to claim 32 wherein each of the plurality of speakers is  
2       a telephone caller.

1       35.           The method according to claim 32 wherein the step of modifying the speech  
2       recognition system comprises a step of modifying an acoustic model thereby forming a  
3       modified acoustic model corresponding to each speaker and wherein the step of storing a  
4       representation of the modified speech recognition system comprises a step of storing a  
5       representation of the modified acoustic model corresponding to each speaker.

1       36.           The method according to claim 35 wherein the representation of the modified  
2       acoustic model corresponding to each speaker is a set of statistics which can be utilized to  
3       modify a pre-existing acoustic model.

1       37.           The method according to claim 35 wherein the representation of the modified  
2       acoustic model corresponding to each speaker is a set of statistics which can be utilized to  
3       modify incoming acoustic speech.

1       38.           The method according to claim 32 further comprising a step of utilizing the

2 modified speech recognition system corresponding to each speaker during the first remote  
3 session with the corresponding speaker.

1 39. The method according to claim 32 wherein the step of modifying the speech  
2 recognition system for each speaker is performed during the first remote session with the  
3 corresponding speaker.

1 40. The method according to claim 32 wherein the step of modifying the speech  
2 recognition system for each speaker is performed after termination of the first remote session  
3 with the corresponding speaker.

1 41. The method according to claim 32 further comprising a step of obtaining the  
2 identification of each speaker during the first remote session with the speaker.

1 42. The method according to claim 41 further comprising a step of authenticating  
2 each speaker's identification by the speaker's speech.

1 43. The method according to claim 33 wherein the step of modifying the speech  
2 recognition system for each speaker is performed during the first remote session with the  
3 corresponding speaker.

1 44. The method according to claim 33 wherein the step of modifying the speech  
2 recognition system for each speaker is performed after termination of the first remote session  
3 with the corresponding speaker.

1 45. The method according to claim 33 further comprising a step of authenticating  
2 each speaker's identification by the speaker's speech.

1 46. The method according to claim 32 further comprising a step of deleting the  
2 representation of a modified speech recognition system corresponding to a speaker.

1 47. The method according to claim 46 wherein the step of deleting the  
2 representation of a modified speech recognition system corresponding to a speaker is  
3 performed when a predetermined period of time has elapsed since the corresponding speaker  
4 last engaged in a remote session.

1 48. A speech recognition system comprising:  
2 a. an interface coupled to receive a remote session from a speaker; and  
3 b. a processing system coupled to the interface to recognize the speaker's speech  
4 wherein the processing system is cumulatively modified according to speech  
5 samples obtained during a plurality of remote sessions with the speaker.

1 49. The speech recognition system according to claim 48 wherein the speaker is a  
2 telephone caller.

1 50. The speech recognition system according to claim 48 wherein the processing  
2 system is modified by modifying an acoustic model.

1 51. The speech recognition system according to claim 50 wherein the processing  
2 system includes a memory for storing the acoustic model in association with an identification  
3 of the telephone caller.

1 52. The speech recognition system according to claim 51 wherein the memory  
2 stores a plurality of acoustic models, one for each of a plurality of telephone callers and  
3 wherein each acoustic model is stored in association with an identification of the



4 corresponding telephone caller.

1 53. The speech recognition system according to claim 52 wherein the selected ones  
2 of the plurality of acoustic models are deleted when a predetermined period of time has  
3 elapsed since the corresponding speaker last engaged in a remote session with the voice  
4 recognizer.

1 54. A method of adapting an acoustic model utilized for speech recognition,  
2 wherein the method comprises steps of:  
3 a. obtaining a speech utterance from a speaker during a remote session;  
4 b. recognizing the speaker's speech utilizing an acoustic model during the remote  
5 session;  
6 c. making a determination relative to the speech utterance; and  
7 d. only when indicated by the determination, performing steps of:  
8 i. modifying the acoustic model according to the speech utterance thereby  
9 forming a modified acoustic model; and  
10 ii. storing a representation of the modified acoustic model in association  
11 with an identification of the speaker.

1 55. The method according to claim 54 wherein the step of making the  
2 determination assigns a confidence level to the speech utterance.

1 56. The method according to claim 54 wherein the step of making the  
2 determination assigns a confidence level to each of a plurality of portions of the speech  
3 utterance.

57. The method according to claim 54 wherein the step of making a determination

2 determines a level of resources available for storing the representation of the modified  
3 acoustic model.

1            58.            The method according to claim 54 wherein the step of making a determination  
2            determines a level of processing resources available for performing the step of modifying the  
3            acoustic model.

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